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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

OAKLAND DIVISION

MEIJER, INC. & MEIJER DISTRIBUTION, INC., on behalf of themselves and all others similarly situated, Plaintiffs, vs. ABBOTT LABORATORIES, Defendant. [caption continues next page]	**Case No. C 07-5985 CW** *Related by Order to:* *Case No. C 04-1511 CW* **EXHIBIT A TO DECLARATION OF CHARLES B. KLEIN IN SUPPORT OF ABBOTT LABORATORIES' MOTION TO COMPEL PRODUCTION OF DOCUMENTS AND INTERROGATORY RESPONSES** Date: June 5, 2008 Time: 2:00 p.m. Courtroom 2 The Honorable Judge Wilken

ROCHESTER DRUG CO-OPERATIVE, INC., on behalf of itself and all others similarly situated,

Plaintiffs,

vs.

ABBOTT LABORATORIES,

Defendant.

Case No. C 07-6010 CW

Related by Order to:

Case No. C 04-1511 CW

EXHIBIT A TO DECLARATION OF CHARLES B. KLEIN IN SUPPORT OF ABBOTT LABORATORIES' MOTION TO COMPEL PRODUCTION OF DOCUMENTS AND INTERROGATORY RESPONSES

Date: June 5, 2008
Time: 2:00 p.m.
Courtroom 2

The Honorable Judge Wilken

LOUISIANA WHOLESALE DRUG COMPANY, INC., on behalf of itself and all others similarly situated,

Plaintiffs,

vs.

ABBOTT LABORATORIES,

Defendant.

Case No. C 07-6118 CW

Related by Order to:

Case No. C 04-1511 CW

EXHIBIT A TO DECLARATION OF CHARLES B. KLEIN IN SUPPORT OF ABBOTT LABORATORIES' MOTION TO COMPEL PRODUCTION OF DOCUMENTS AND INTERROGATORY RESPONSES

Date: June 5, 2008
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Courtroom 2

The Honorable Judge Wilken

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Exhibit

A

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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

(OAKLAND DIVISION)

MEIJER, INC. & MEIJER DISTRIBUTION, INC., on behalf of themselves and all others similarly situated, Plaintiffs, v. ABBOTT LABORATORIES, Defendant.	Case No. C 07-5985 CW **CLASS CERTIFICATION DECLARATION OF HAL SINGER, PH.D.**
--[*caption continues next page*]--	**DOCUMENT SUBMITTED UNDER SEAL**

ROCHESTER DRUG CO-OPERATIVE, INC., on behalf of itself and all others similarly situated, Plaintiff, v. ABBOTT LABORATORIES, Defendant.	Case No. C 07-6010 CW **CLASS CERTIFICATION DECLARATION OF HAL SINGER, PH.D.**
LOUISIANA WHOLESALE DRUG COMPANY, INC., on behalf of itself and all others similarly situated, Plaintiff, v. ABBOTT LABORATORIES, Defendant.	Case No. C 07-6118 CW **CLASS CERTIFICATION DECLARATION OF HAL SINGER, PH.D.**

DOCUMENT SUBMITTED UNDER SEAL

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
(OAKLAND DIVISION)

MEIJER, INC. & MEIJER DISTRIBUTION, INC., on behalf of themselves and all others similarly situated, Plaintiffs, v. ABBOTT LABORATORIES, Defendant.	Case No. C 07-5985 CW *Related per October 31, 2007 Order to Case No. C-04-1511 (CW)* <u>CLASS CERTIFICATION DECLARATION OF HAL SINGER, PH.D.</u> <u>FILED UNDER SEAL</u>
ROCHESTER DRUG CO-OPERATIVE, INC., on behalf of itself and all others similarly situated, Plaintiff, v. ABBOTT LABORATORIES, Defendant.	Case No. C 07-6010 CW *Related per October 31, 2007 Order to Case No. C-04-1511 (CW)*
LOUISIANA WHOLESALE DRUG COMPANY, INC., on behalf of itself and all others similarly situated, Plaintiff, v. ABBOTT LABORATORIES, Defendant.	Case No. C 07-6118 CW *Related per October 31, 2007 Order to Case No. C-04-1511 (CW)*

INTRODUCTION, ASSIGNMENT, AND SUMMARY OF OPINIONS

1. I have been asked by counsel for Meijer, Inc. & Meijer Distribution, Rochester Drug Cooperative Inc., and Louisiana Wholesale Drug Company, Inc. (collectively, "plaintiffs") to analyze whether the antitrust violation and antitrust injury to (or impact on) the proposed class of direct purchasers in this case can be reliably analyzed and proven using methods and evidence common to the class as a whole. It is my understanding that plaintiffs seek to measure antitrust impact here in the form of the alleged overcharges to plaintiffs and members of the proposed class. Accordingly, plaintiffs' counsel has asked that I render an opinion as to whether common methods and evidence are available to show that all (or nearly all) members of the proposed class paid more for Norvir and/or Kaletra as a result of the conduct challenged in plaintiffs' Consolidated Amended Complaint.[1] Plaintiffs' counsel has also asked me to assess whether standard economic models and methods are available to compute damages to the class as a whole based on classwide evidence.

2. For the purposes of this declaration, I assume that plaintiffs' allegations about the conduct of defendant Abbott Laboratories ("Abbott") are correct.[2] I further assume that (1) Abbott has monopoly power in the market for boosting protease inhibitors ("Boosting Market"),[3] and (2) Abbott has engaged in anticompetitive conduct to leverage its Boosting Market monopoly power into the related market for boosted protease inhibitors ("Boosted Market").[4]

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1. Consolidated Amended Complaint, Case No. C 07-5985 CW (hereinafter *Complaint*).
2. *Id.*
3. *Id.* ¶¶ 17, 18. Abbott has admitted to having a monopoly over the Boosting market. *See* Notice of Motion and Motion of Abbott Laboratories to Dismiss Plaintiffs' Consolidated Amended Compliant, Case 4:07-cv-05985-CW, Jan. 31, 2008, at 6 ("Throughout the nearly four years of litigation concerning Norvir's price increase, nobody has ever contested that Abbott has a legal monopoly over the Boosting Market—that is, the one-product market covering Norvir's active ingredient, ritonavir.").
4. *Id.* ¶¶ 17, 18 61, 67, 71.

3. Plaintiffs' central allegation in this case is that, faced with the impending threat of new competition in the Boosted Market, Abbott raised the wholesale acquisition cost (WAC) (sometimes referred to as the "list" price) of Norvir by 400 percent

, as part of a scheme to leverage its admitted monopoly power in the Boosting Market to impair rivals in the Boosted Market and thereby maintain and enhance monopoly power in the Boosted Market.[5] Norvir, a Boosting drug, is primarily used to make other drugs—that is, Boosted drugs—more effective in treating human immunodeficiency virus ("HIV"). Abbott also manufactures the drug Kaletra, which is a combination of the active ingredient in Norvir (ritonavir) and lopinavir, a Boosted drug. Plaintiffs allege that through this 400-percent-Norvir-price increase, Abbott used its monopoly over Norvir to impair its Boosted Market rivals.[6]

4. According to plaintiffs, the conduct in question neutralized the potential competition from two newer Boosted drugs, Reyataz (a product of Bristol-Myers Squibb) and Lexiva (a product of GlaxoSmithKline). Plaintiffs claim that Kaletra, Reyataz, and Lexiva are all in the Boosted Market.[7] Plaintiffs claim further that members of the proposed class (defined below) have been deprived of the benefit of unimpaired competition in the Boosted Market, and as a result, paid artificially inflated prices for Norvir and Kaletra. Without this anticompetitive conduct, plaintiffs claim that the price of both Norvir and Kaletra would have been lower than they actually were during the relevant time period.[8] Plaintiffs charge that Abbott's conduct represents behavior in violation of section 2 of the Sherman Act.[9] For purposes of this

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5. *Id.* ¶¶ 24-25.
6 *Id.*
7. *Id.* ¶¶ 22-23.
8. *Id.* ¶ 59.
9. *Id.* ¶ 5.

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declaration, I have been asked to assume a but-for world in which Abbott continues to sell Norvir and Kaletra, but in which Abbott does not impose the 400 percent price increase in December 2003, but instead maintains the same price for Norvir. I also, alternatively, assume a but-for world in which Abbott imposes a price increase on Norvir, but only up to the level that would be allowed under the *Cascade* standard.[10]

5. Plaintiffs have brought an action on behalf of a proposed class of direct purchasers who bought Norvir and Kaletra from Abbott. Plaintiffs propose the following class:

> All persons or entities in the United States that purchased Norvir and/or Kaletra directly from Abbott or any of its divisions, subsidiaries, predecessors, or affiliates during the period from December 3, 2003 through such time as the effects of Abbott's illegal conduct have ceased, excluding governmental entities, Abbott, and Abbott's divisions, subsidiaries, predecessors, and affiliates.[11]

Plaintiffs' counsel has informed me that certain direct purchasers have opted out of the class and have filed their own individual suits. These purchasers include Supervalue Inc., Ahold, Safeway Inc., Walgreen Co., The Kroger Co., New Albertson's, Inc., American Stores Company, Inc., Rite Aid, JCG USA, Maxi Drug, Inc., Eckerd Co., CVS Pharmacy, Inc., and Caremark, L.L.C (hereinafter, "Opt-Outs"). I understand that certain of these Opt-Outs are proceeding based on assignments of claims from class member wholesalers. Accordingly, I understand that not only should these entities be excluded from the class, but also that I will eventually need to exclude from any assessment of class purchase volumes sales made by class member wholesalers to these Opt-Outs. Taking these restrictions into account, my initial review of Abbott's transactional sales database produced in this litigation indicates that and that they are dispersed geographically throughout the United States.

10. *Cascade Health Solutions v. PeaceHealth*, 515 F.3d 883 (9th Cir. 2007) (hereinafter *Cascade*).

11. *Complaint* ¶ 13.

6. My report is organized as follows. In Part I, I explain the appropriate framework for analyzing the alleged antitrust violation. To assist in proving a violation in a case involving exclusionary conduct, an economist assesses whether the assumptions of economic models of monopoly extension or monopoly preservation are satisfied. If the assumptions of the models are satisfied, then it follows that Abbott had an incentive and the ability to extend or preserve its alleged monopoly power.

7. I also explain in Part I that one appropriate classwide economic framework for assessing the merits of the plaintiffs' claims is that of monopoly leveraging through a bundled-pricing scheme. One reasonable interpretation of the economic logic underlying plaintiffs' allegations is that Abbott's conduct induced buyers to pay supra-competitive prices for lopinavir (sold as part of Kaletra) by setting a penalty price for Norvir when Norvir is purchased as a stand-alone product. Recent economic research shows that "forced bundles"—that is, bundles that involve a penalty price for the monopolized product in excess of the price that would have prevailed for the same product absent the anticompetitive conduct (the "Independent Monopoly Price")—bear similarities with tying arrangements, and in certain circumstances, exhibit the exact same welfare characteristics of a tie.[12] Thus, for the remainder of this declaration, I will refer to the product over which Abbott has monopoly power (Norvir) as the "tying" (or the Boosting) market and the market where the alleged leveraging occurs as the "tied" (or the Boosted) market.[13] These labels are adopted for the sake of brevity and should not be taken to

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12. *See* Patrick Greenlee, David S. Reitman, David S. Sibley, An Antitrust Analysis of Bundled Loyalty Discounts, Economic Analysis Group Discussion Paper No. 04-13 (2006).

13. For purposes of this Declaration, I accept plaintiffs' definitions of these markets, and do not have an opinion at this stage as to whether they constitute appropriate relevant antitrust markets for analyzing the claims in this case. Any assessment of relevant markets in this case, however, would involve exclusively common evidence, and it would need to be analyzed in the context of the claims in this particular case. *See, e.g.*, Aaron Edlin & Daniel Rubinfeld, *Exclusion or Efficient Pricing: The "Big Deal" Bundling of Academic Journals*, 72 ABA ANTITRUST

mean that the accusations of exclusionary conduct here are tantamount to a tie. I emphasize here that, at this stage of the case, I have not settled upon any particular model for analyzing the merits of plaintiffs' claims, but rather present in Part I a variety of models that could be reliably used to assess the challenged conduct in this case to demonstrate that the analysis of the alleged antitrust violation will inevitably be of classwide applicability.

8. In Part II, I explain the appropriate framework for assessing antitrust impact—that is, whether plaintiffs and members of the class paid more for Norvir, Kaletra, or both, as a result of Abbott's conduct. I demonstrate below that common evidence can be used to show that plaintiffs and class members paid artificially inflated prices in one or both of the following ways: (1) all class members paid more for Norvir as a direct result of the challenged conduct (which, of course, involves the 400 percent increase in the price of Norvir); and, (2) all class members paid higher prices for Kaletra due to Abbott's extension of monopoly power from the Boosting Market into the Boosted Market.

9. Evaluating antitrust impact in the form of overcharge here does not require review of evidence relating to any specific direct purchaser. Thus, impact can be assessed through the use of predominantly, if not exclusively, common evidence. As detailed below, the following categories of evidence are available to prove that all class members paid artificially inflated prices for Norvir and Kaletra as a result of the conduct at issue: (1) governmental and academic studies demonstrating the economic effects of competition between therapeutically similar branded drugs; (2) Abbott's internal projections regarding the effects of its conduct; (3) standard economic theory and models regarding the effects of monopoly pricing, monopoly leveraging, and bundling on pricing; and (4) Abbott's own transactional database and other sources of

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LAW JOURNAL 134 (2004) ("Because there are frequently many possible markets one can take into consideration, the relevant markets depend on the competitive concerns that are at issue.").

marketwide data on pharmaceutical pricing and sales, including data from Medi-Span and IMS Health, which reflect, among other things, actual marketplace behavior before and after the December 2003 Norvir price increase.

10. In Part IV, I offer an economically reliable framework for estimating aggregate overcharges to the class as a whole. Under this framework, computing aggregate overcharges would incorporate the following inputs common to the class as a whole: (1) total actual purchases by the class, (2) average actual prices paid by the class, and (3) average but-for prices that would have been paid by the class. I show below that the calculation of aggregate overcharges on Norvir can be assessed through the use of common evidence using either a consumer-welfare standard or the standard set out in *Cascade*.[14] I then show that models that rely on classwide evidence can also be used to assess overcharges to the class on Kaletra. These models include the Nash-Bertrand differentiated products model and the raising-rivals'-costs model. Because the analyses and data that inform the computation of damages are common to the class, I conclude that assessing aggregate damages is amenable to classwide analysis.

11. In preparation for writing this declaration, I have reviewed the plaintiffs' Consolidated Amended Complaint, internal Abbott documents that have been produced in discovery, certain legal filings of both plaintiffs and Abbott, opinions rendered by the Court, and academic articles developing economic theory relevant to the instant case. I have also reviewed academic and governmental studies regarding the structural and economic characteristics of the pharmaceutical industry, and have spoken with Larry Doud, CEO of plaintiff Rochester Drug Cooperative, Inc. regarding the business of wholesaling pharmaceuticals and pharmaceutical pricing. Appendix 1 contains a list of materials that I relied upon to form my opinions. The

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14. *Cascade*, 515 F.3d at 883.

conclusions that I reach in this declaration are based on a synthesis of the materials described above and my experience and qualifications described above.

QUALIFICATIONS

12. My name is Hal J. Singer. I am President of Criterion Economics. My areas of economic expertise are antitrust, industrial organization, and regulation. I have applied my expertise to several regulated industries, including insurance, pharmaceuticals, health care, telecommunications, and video programming.

13. I am the co-author of the book *Broadband in Europe: How Brussels Can Wire the Information Society* (Kluwer/Springer Press 2005). I also have published a book chapter in *Access Pricing: Theory, Practice and Empirical Evidence* (Justus Haucap and Ralf Dewenter eds., Elsevier Press 2005) and in *Handbook of Research in Trans-Atlantic Antitrust* (Philip Marsden, ed., Edward Elgar Publishing 2006).

14. I have published scholarly articles in several economics and legal journals, including *American Economic Review Papers and Proceedings*, *Berkeley Technology Law Review*, *Canadian Journal of Law and Technology*, *Federal Communications Law Journal*, *Harvard Journal of Law and Technology*, *Hastings Law Journal*, *Journal of Business and Finance*, *Journal of Competition Law and Economics*, *Journal of Financial Transformation*, *Journal of Industrial Economics*, *Journal of Insurance Regulation*, *Journal of Network Industries*, *Journal of Regulatory Economics*, *Journal of Telecommunications and High Tech Law*, *Review of Network Economics*, *Telecommunications Policy Journal*, *Topics in Economics Analysis and Policy*, and *Yale Journal on Regulation*.

15. In regulatory proceedings, I have presented economic testimony in several forums, including the U.S. Federal Communications Commission, the U.S. Federal Trade Commission, the Antitrust Division of the U.S. Department of Justice, the U.S. National

Highway Traffic and Safety Administration, the House of Commons of Canada, the Canadian Radio-television and Telecommunications Commission, and the U.S. Congressional Budget Office.

16. I have also served as a testifying expert in several antitrust litigation matters. I submitted expert testimony on behalf of a class of hospitals in *Natchitoches Parish Hosp. Serv. Dist. v. Tyco Int'l, Ltd., et al.* (D. Mass.), which involves the sale of sharps containers. I currently serve as the damages expert on behalf of a class of hospitals in *Southeast Missouri Hospital et al. v. C.R. Bard, Inc.* (E.D. Mo.), which involves the sale of urological catheters. On behalf of PacifiCare, a health maintenance organization, I submitted a report that estimated overcharge damages associated with conduct by a brand name manufacturer that allegedly impeded entry by generic pharmaceutical manufacturers in violation of section 2 of the Sherman Act in *In Re Tricor Indirect Purchaser Antitrust Litigation* (D. Del.). My other experience as a testifying expert in litigation is summarized in my CV.

17. In addition to litigation, I have provided expert testimony in regulatory proceedings and commissioned white papers for several firms and trade associations, including 1-800 CONTACTS, Advanced Medical Technology Association (AdvaMed), Allegheny Communications, AT&T, Bell Canada, BellSouth, Broadband Roundtable, Cellular Telephone Industry Association (CTIA), Coventry First, General Motors, Harvest Partners, Internet Innovation Alliance, Medical Device Manufacturers Association, Mid-Atlantic Sports Network (Baltimore Orioles), National Association of Broadcasters, the National Football League (NFL), Qwest, SBC, TELUS, Verizon, and Walt Disney.

18. Before joining Criterion, I worked at LECG, an economic consulting firm based in Emeryville, California. In addition, I have worked as an economist for the Securities and

Exchange Commission and the Army Corps of Engineers, and I have taught microeconomics and international trade at the undergraduate level.

19. I earned M.A. and Ph.D. degrees in economics from the Johns Hopkins University and a B.S. *magna cum laude* in economics from Tulane University.

20. I file this report in my individual capacity and have no financial stake in the outcome of this case. My hourly rate in this matter is $495.

21. My curriculum vitae is attached as Appendix 2 to this report.

I. ECONOMIC ANALYSIS OF THE ANTITRUST VIOLATION WILL NOT VARY BY CLASS MEMBER

22. In this section, I discuss a variety of economic frameworks for assessing the alleged antitrust violations. From the perspective of economic theory, bundled-pricing arrangements are anticompetitive when they allow a firm with market power to increase its monopoly profits to the detriment of consumers. For many years, proponents of the "Chicago School" of economics argued that a monopolist would not employ leveraging, tie-ins, and bundles unless such conduct increased its efficiency. The rationale for this theory was that the monopolist could earn no more than the single-monopoly profit that it already enjoyed.[15] However, more recent research has illustrated situations where a monopolist can leverage its market power to increase its profits to the detriment of consumers. In this section, I show that the applicability of economic theory relevant to assess the antitrust violation turns on evidence and analysis that are necessarily common to the class. I also explain how the anticompetitive violation can be dealt with at a classwide level under the *Cascade* standard.[16]

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15. *See, e.g.*, ROBERT H. BORK, THE ANTITRUST PARADOX 372-373 (Free Press 1978).
16. *Cascade*, 515 F.3d at 910.

A. Review of Plaintiffs' Accusations

23. Competing boosted protease inhibitors ("PIs") are used in combination with Norvir to reach their maximum efficacy.[17] Thus, when the price of Norvir skyrocketed, these treatments became more expensive relative to Kaletra. Common evidence and analysis are available to show that increasing the stand-alone price of Norvir effectively increased the costs of Abbott's rivals: the Norvir price increase acted, effectively, as an increase in the cost of using alternative Boosted PIs. In particular, for every one-dollar increase in the price of Norvir, Abbott's rivals would need an extra dollar of revenue to compensate purchasers for "breaking the bundle"—else rivals selling a fungible product in a competitive market would be operating at a loss.

24. Furthermore, plaintiffs allege that Abbott improperly maintained its monopoly power in the Boosting Market by deceptively inducing makers of Boosted PIs to standardize use of Norvir instead of exploring Boosting Market alternatives.[18] Specifically, plaintiffs aver that while Abbott considered plans to remove Norvir from the market or dramatically increase the price of Norvir, Abbott induced competitors to license Norvir to encourage competitor-boosted PIs to be co-administered with Norvir.[19] According to plaintiffs, the result of this deception was that rival firms did not use their resources to develop alternatives to Norvir or less Norvir-intensive versions of their boosted PIs, allowing Abbott to maintain dominance over the Boosting Market.[20]

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17. *Complaint*, ¶ 13.
18. *Id.* ¶¶ 69.
19. *Id.* ¶¶ 15.
20. *Id.* ¶¶ 18.

B. Common Proof of Violation under the Consumer-Welfare Standard

25. Standard economic theory indicates that conduct that raises rivals' costs can result in anticompetitive impairment of competition when (a) rivals are denied economies of scale and thus their per-unit costs are higher, or (b) rivals are denied access to most efficient distribution channel and thereby face higher selling costs at all levels of output. Under the first situation, exclusionary conduct can impose barriers to entry and expansion that impede rivals' scale, causing them to be less efficient when markets exhibit economies of scale, scope, research, or when markets display network effects.[21] Under the second situation, exclusionary conduct can affect pricing outcomes even if rivals achieve the requisite scale economies, as selling costs are higher when rivals are forced to use inferior distribution channels.

26. Applying these economic models here would involve evidence and analysis that would not vary across class members. For example, an examination of sellers' costs (that is, the costs of the manufacturers) necessarily involves evidence common to the class. Thus, to show economies of scale, which is an assumption of some models of monopoly extension, an economist would examine the cost data of participants in the Boosted Market to verify that per-unit costs decrease at higher levels of output. As such cost data pertain to the supply side (that is, manufacturer side) of the market, the analysis would produce the same result for each class member. Because the evidence would not differ between class members, these issues are conducive to resolution at the class level.

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21. *See* Thomas G. Krattenmaker & Stephen C. Salop, *Anticompetitive Exclusion: Raising Rivals' Costs to Achieve Power Over Price*, 96 YALE LAW JOURNAL 209, 234-45 (1986); Einer Elhauge, *Defining Better Monopolization Standards*, 56 STANFORD LAW REVIEW 253 (2003); James E. Hodder & Yael A. Ilan, *Declining Prices and Optimality When Costs Follow an Experience Curve*, 7 MANAGERIAL AND DECISION ECONOMICS 229 (1986); Michael L. Katz & Carl Shapiro, *Systems Competition and Network Effects*, 8 JOURNAL OF ECONOMIC PERSPECTIVES 93 (1994); Dennis W. Carlton, *A General Analysis of Exclusionary Conduct and Refusal to Deal—Why Aspen and Kodak Are Misguided*, 68 ANTITRUST LAW JOURNAL 659 (2001); Michael Whinston, *Tying, Foreclosure and Exclusion*, 80 AMERICAN ECONOMIC REVIEW 837-60 (1990).

27. A second classwide economic framework potentially applicable here is to assess whether Abbott was able to squeeze buyers' surplus in the Boosting Market by introducing an anticompetitive "bundle."[22] Under this theory of monopoly leveraging, the purpose of the Norvir price increase was to induce ultimate purchasers to accept Abbott's Kaletra "bundle" of its Boosting and Boosted drugs. This "bundling" strategy would result in anticompetitive harm if it allowed Abbott to achieve or enhance its market power in the Boosted market. This "squeezing surplus" theory of violation depends on proof that the penalty price for the tying product (Norvir) was set above the "Independent Monopoly Price." To assess the applicability of this model to the present case, an economist would examine whether Abbott had monopoly power in the Boosting market and whether Abbott set a penalty price for this product. Abbott has already admitted to having monopoly power over Norvir.[23] Steps taken to determine whether the extant penalty price of Norvir exceeds the Independent Monopoly Price would exclusively involve evidence common to the class, such as estimating the elasticity of demand for Norvir and Abbott's incremental cost of producing Norvir.

C. Common Proof of Violation under the *Cascade* Test

28. In *Cascade*, the Ninth Circuit proposed an alternative standard to assess when bundling resulted in a violation of the antitrust laws:

> Thus, a plaintiff who challenges a package discount as anticompetitive must prove that, when the full amount of the discounts given by the defendant is allocated to the competitive product or products, the resulting price of the competitive product or products is below the defendant's incremental cost to produce them.[24]

29. Recent economic research has shown that the *Cascade* test may not be appropriate for assessing whether bundled pricing is anticompetitive, as it may set the bar too high in a case

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22. *See* Greenlee, Reitman & Sibley, *supra*.

23. *See* Notice of Motion and Motion of Abbott Laboratories to Dismiss Plaintiffs' Consolidated Amended Compliant, *supra*.

24. *Cascade*, 515 F.3d at 910.

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like the present one.[25] I understand the Court has taken that view.[26] Thus, in my preliminary assessment, the economic models discussed in Section II.B above provide the most appropriate framework for deciding the merits of the instant case. Nevertheless, in this section, I show that my preliminary review of some of the classwide evidence indicates that the conduct appears to fail the *Cascade* standard.

30. More importantly, regardless of whether an economist would ultimately conclude that the conduct in question fails the *Cascade* test, the example I provide below demonstrates that the issue turns on common evidence. The reason is that the evidence necessary to show anticompetitive violation under *Cascade* is largely the cost data of the defendant, in this case Abbott. Because Abbott's aggregate cost data would not vary across members of the class, the results of the test necessarily pertain to the class as a whole.

31. The overly stringent standard articulated in *Cascade* focuses on the impairment of rivals. Based on my review of the record, $1.64 represents the residual margin for rival makers of boosted PIs under the *Cascade* test.[27] Given the logic of the "attribution test" articulated in *Cascade*, this $1.64 figure should be understood as the margins an equally efficient competitor selling a fungible product would make on its Boosted drug after compensating buyers for breaking the Kaletra "bundle" in the post price-increase world. Table 1 illustrates the relevant calculations.

25. *See* Greenlee, Reitman & Sibley, *supra*.

26. *See* Order Denying Abbott's Motion to Dismiss, Case 4:07-cv-05702-CW, Apr. 11, 2008 at 13 ("Abbott's sale of Kaletra—if it represents a bundled discount—is a strong candidate for the exception contemplated by the Ninth Circuit. This is because the stated goal of the *Cascade* rule—making unlawful only pricing that would exclude equally efficient competitors from the market—would not be served by applying the rule here.").

27. *See id.* at 13-14 ("The imputed price of the lopinavir portion of Kaletra is the difference between the two amounts, or $1.64"). Abbott's most recent filing appears to indicate that they agree. *See* Abbott Laboratories' Supplemental Brief in Support of Its Summary Judgment Motion, or, In the Alternative, Brief in Support of (1) Motion for Leave to File Reconsideration Motion, (2) Motion for Continuance, and (3) Petition to Certify Interlocutory Appeal Under § 1292(B), Case 4:04-cv-01511-CW, Apr. 25, 2008 at 3.

TABLE 1: DERIVATION OF MARGIN LEFT OVER FOR "EQUALLY EFFICIENT COMPETITOR"

Pricing Category	Derivation	Amount
Independent Monopoly Price of Norvir	(1)	
Penalty Price of Norvir	(2)	
December 2003 Price of Kaletra	(3)	
December 2003 In-Bundle Price of Lopinavir	(4) = (3)-(1)	
Penalty for Breaking Kaletra Bundle	(5) = (2)-(1)	
Margin Left Over for "Equally Efficient Competitor"	(6) = (4)-(5)	$1.64

Source: .

The *Cascade* test posits that the $1.64 margin left over for a competitor should be compared to the defendant's average variable cost of producing lopinavir.[28] It is in this sense that the test provides an indicator as to whether a rival selling a fungible product with the same average variable costs as Abbott would be able to compensate buyers for breaking the bundle (that is, buying stand-alone Norvir at the penalty price) and still earn a profit.[29]

32. The next step in applying the *Cascade* test is to specify what costs should be included in the calculation of Abbott's average variable cost. For the purposes of calculating Abbott's average variable cost as it relates to the *Cascade* test, an economist would attempt to include all recurring costs of doing business.[30] Variable costs can be very simply defined as costs

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28. *Cascade*, 502 F.3d at 911 ("We have also held that a plaintiff can establish a prima facie case of predatory pricing by proving that the defendant's prices were below average variable costs. We see no reason to depart from these principles in the bundled discounting context, and we hold that the appropriate measure of costs for your cost-based standard is average variable cost.").

29. It bears emphasis that complete foreclosure of rivals—that is, foreclosure that induces rivals to exit—is not necessary to reduce consumer welfare. Consumers can be injured when rivals are partially foreclosed, so long as that foreclosure increases rivals' costs. Moreover, the fact that rivals like Bristol-Myers Squibb and GlaxoSmithKline continue to operate in the Boosted Market does not imply that Abbott's pricing is competitive under the *Cascade* standard, as that standard presumes that the tied products offered by the defendant and its rivals are fungible and that the market is competitive. While I am not offering an opinion on this subject, some of the materials that I have reviewed appear to indicate that Abbott's Boosted drug is likely inferior to that of its rivals.

30. The Court has already noted the validity of including recurring non-manufacturing costs. *See* Order Denying Abbott's Motion to Dismiss, Case 4:07-cv-05702-CW, Apr. 11, 2008 at 14 ("The Meijer Plaintiffs argue that Abbott's average variable costs should include more than just the cost of manufacturing; they argue that marketing and promotion costs should also be included. This is a valid argument, and would raise the average variable cost above the pennies-per-pill cost of manufacturing.").

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"that increase when the firm's output rises."[31] However, as the relationship between cost and output varies according to the timeframe considered, establishing the appropriate economic context is essential to defining average variable cost correctly. The *Cascade* test is derived from a test of predatory pricing in a single product case. Thus, in my preliminary view, the costs in question are likely to be those that apply when a firm decides whether to remain in or exit the market (that is, the traditional "shutdown analysis").[32] According to the classic decision-rule for shutdown, a firm will exit the industry when price falls below its average variable cost. For the purposes of shutdown analysis, average variable cost would include all costs with the exception of costs to which the firm is pre-committed or otherwise cannot avoid (that is, "sunk costs").[33] Because elements of costs like advertising, promotion, and further research on a product are all factors that would drop to zero if the firm were to exit the market, they are, by definition, not sunk costs. Accordingly, it is my preliminary view that these factors should be considered when calculating average variable cost as it pertains to the shutdown analysis embodied in the *Cascade* test.

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Thus, I use these figures as an example of how applying the *Cascade* test here would require only the use of evidence common to the class. Table 2 provides an example of a possible derivation of Abbott's

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31. *See* WILLIAM J. BAUMOL & ALAN S. BLINDER, MICROECONOMICS PRINCIPLES AND POLICY 156 (Harcourt Brace & Company 7th ed. 1997).

32. *See* DENNIS W. CARLTON & JEFFREY M. PERLOFF, MODERN INDUSTRIAL ORGANIZATION 61 (Addison-Wesley 3rd ed. 2000) ("The price at which shutdown occurs is above average variable cost and closer to average cost the greater the proportion of fixed costs that are avoidable. In the extreme, when there are no sunk costs (all fixed costs are avoidable) the shutdown point coincides with the minimum point on the AC curve. Thus, if it has no sunk costs, a firm shuts down before it incurs economic losses.").

33. *See* WILLIAM J. BAUMOL & ALAN S. BLINDER, *supra* at 216 ("To understand the logic of the choice between shutting down and remaining in operation, we must return to the distinction between costs that are sunk and those that are variable in the short run.").

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average variable cost of producing Kaletra as a percentage of sales with information drawn from an internal Abbott cost document:

TABLE 2: EXAMPLE OF POSSIBLE DERIVATION OF ABBOTT'S AVERAGE VARIABLE COST FOR KALETRA

Cost Category	Derivation	Amount (millions)
Kaletra Sales	(1)	
Cost of Sales	(2)	
Variable R&D	(3)	
Promotion	(4)	
Sales Force	(5)	
Variable Costs as a Percentage of Sales	(6) = [(2)+(3)+(4)+(5)]/(1)	

Source: NOR 00062663.

analysis turns on Abbott's internal cost data illustrates that the result would not vary by class member. By definition, all class members purchase Norvir, Kaletra, or both from Abbott. Accordingly, the same Kaletra cost data necessarily applies to the class as a whole. In sum, I find that the use of the "attribution test" articulated by the Court in *Cascade* is conducive to analyzing the alleged antitrust violation using classwide evidence and analysis.

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II. Proving Fact of Antitrust Impact on All Class Members Can Be Done with Classwide Evidence and Analysis

34. I understand that plaintiffs have alleged that class members suffered antitrust impact in the form of paying overcharges on Norvir or Kaletra or both. As detailed below, common evidence and methods are available to show that all class members paid artificially inflated prices for Norvir and/or Kaletra due to the challenged conduct. These common methods take a variety of forms, and would rely upon the following categories of class-wide evidence: (1) governmental and academic studies demonstrating the economic effects of competition between therapeutically similar branded drugs; (2) internal projections performed by Abbott; (3) standard economic theory and models regarding monopoly pricing, monopoly leveraging, and bundling; and (4) Abbott's own transactional database and other sources of marketwide data on pharmaceutical pricing and sales (including data from IMS Health and Medi-Span), reflecting actual marketplace behavior before and after the December 2003 Norvir price increase. This evidence can then be used to show that all class members would have paid less for Norvir and Kaletra in the but-for world.

A. Commonalities Regarding Class Member Purchase Prices and Practices

35. Manufacturers of prescription drugs typically sell them directly to wholesalers, large pharmacy chains, including grocery supermarkets and mass merchandiser chains with pharmacies, hospitals, and government health facilities, and some managed care entities.[34]

34. *See* Congressional Budget Office, *How Increased Competition from Generic Drugs has Affected Prices and Returns in the Pharmaceutical Industry*, July 1998, at 14 (showing that manufacturers sell directly to wholesalers, hospitals, HMOs, long-term care facilities, clinics, and mail order outlets and noting that sometimes chain-store pharmacies buy directly from the manufacturer) (hereinafter *CBO Study*).

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However, the plaintiff class explicitly excludes governmental entities.

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36. *See, e.g.*, Medi-Span Reference Pricing Definitions and Reporting Guidelines, at 1-2, available at http://www.medispan.com/images/AWP%20Policy.pdf.

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Wholesalers sell prescription drugs to pharmacies, hospitals, clinics, or other entities that do not purchase directly from the manufacturers. Pharmacies, hospitals, clinics, and physician offices then sell or dispense prescription drugs pursuant to physicians' directives.

the common evidence and analysis available to show that the artificial price inflation on Norvir and Kaletra described below is necessarily classwide evidence that all class members paid higher prices due to the challenged conduct.

B. Proving That All Class Members Paid More for Norvir Due to the Challenged Conduct Will Involve Classwide Evidence and Analysis

37. In this section, I show that fact of overcharge on Norvir can be proven for all class members through the use of common evidence and analyses under two different economic frameworks: (1) the consumer-welfare standard, and (2) the "safe harbor" standard implied by *Cascade*. Under both frameworks, the common evidence for proving that all class members paid

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38. The CBO defines the chargeback system as follows: "Together, manufacturers and wholesalers have developed a computerized system whereby the wholesaler learns of the discounted price negotiated between a manufacturer and a particular purchaser. The wholesaler delivers the drug at the discounted price, informs the manufacturer of the discounted delivery, and then is reimbursed by the manufacturer electronically. Such discounts handled through a wholesaler are generally known as chargebacks (although that term is sometimes used to encompass other types of discounts as well)." *See CBO Study*, *supra*, at 24-25.

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more for Norvir includes, for instance: (a) Abbott's own documents, which reflect its decision to impose a 400 percent price increase on Norvir; (b) Abbott's transactional database reflecting prices paid for Norvir by all class members before and after the December 2003; and, (c) Abbott's internal documents reflecting its costs associated with Kaletra and lopinavir.

1. Using a Consumer-Welfare Standard

38. Under traditional antitrust analysis, one can prove that all class members paid higher prices by comparing the actual world to a hypothetical "but-for" world where the conduct in question did not occur. Given that the conduct at issue involves, among other things, a 400 percent price increase on the daily dose of Norvir, the differential between actual prices paid, post December 2003, and the but-for prices class members would have paid absent the price hike, represents the overcharge to class members. This comparison of actual prices to but-for prices as it pertains to Norvir will turn on exclusively common evidence, including but not limited to Abbott's transactional database, Abbott's internal documents, and/or other common data sources such as IMS Health and Medi-Span.

Moreover, even if, in theory, one or more class members did not pay WAC or a price based explicitly on WAC, economic theory suggests that it is unlikely that the Norvir price increase would have had no inflationary effect on the price paid by any non-governmental purchaser.

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2. Using the *Cascade* "Safe Harbor" Test

39. Similarly, common evidence is available to show that all class members were overcharged on Norvir where the *Cascade* "safe harbor" is incorporated into the impact analysis. If the *Cascade* test were applied here as the exclusive test for assessing anticompetitive conduct, Abbott could have raised its Norvir price to a certain level (that is, the "safe harbor") without running afoul of the antitrust laws. The only difference between the "consumer welfare" approach discussed above and the "safe harbor" approach discussed here is that to compute the "safe harbor," an economist would also need to perform the cost-based "attribution" analysis provided for in *Cascade.* As with the consumer-welfare analysis, performing the *Cascade* test would also involve solely common evidence, including Abbott's internal cost data for Kaletra (more specifically lopinavir).

40. To apply the more stringent *Cascade* test, for explanatory purposes only, I have set out a preliminary computation in the following table to show the type of classwide analysis that would be involved in computing the *Cascade* "safe harbor," and thus to demonstrate how an economist would establish a lower bound on the Norvir overcharge.

TABLE 3: PRELIMINARY DERIVATION OF ABBOTT'S "SAFE HARBOR" PRICE FOR NORVIR

Category	Derivation	Amount
Independent Monopoly Price of Norvir	(1)	
Penalty Price of Norvir	(2)	
December 2003 Price of Kaletra	(3)	
December 2003 in-bundle Price of lopinivir	(4) = (3)-(1)	
Penalty for Breaking Kaletra "Bundle"	(5) = (2)-(1)	
Margin Left Over for "Equally Efficient Competitor" in Boosted Market	(6) = (4)-(5)	
AVC as Percentage of lopinavir Revenue	(7)	
Per unit AVC	(8) = (7)*(4)	
Cascade test	(9) = (6)-(8)	
Norvir Safe Harbor under *Cascade*	(10) = (2)+[(6)-(8)]	
Norvir Lower Bound per unit Overcharges	(11) = (2)-(10)	

Source:

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Under this "safe harbor" analysis, the anticompetitive overcharge would begin when the penalty price of Norvir becomes high enough to impair an equally efficient (fungible) competitor in the Boosted Market, and thus fail the *Cascade* test. The assumptions regarding average variable cost are those developed in Section II.C. It is my preliminary view that the attribution test embodied in *Cascade* is too stringent for this case. Nevertheless, the "safe harbor" analysis could potentially serve as an alternate lower bound on the Norvir overcharge. The main point here is that regardless of which methodology ("consumer welfare" or "*Cascade* safe harbor") is adopted, determining whether all class members paid more for Norvir as a result of the challenged conduct will involve evidence exclusively common to the class as a whole, including but not limited to, Abbott's internal documents, Abbott's database, Abbott's pricing and cost data, and other evidence and data of classwide applicability.

C. Proving That All Class Members Paid More for Kaletra Due to the Challenged Conduct Will Involve Classwide Evidence and Analysis

41. The process of proving classwide overcharges for Kaletra involves a two step analysis: (1) showing that rivals were impaired as discussed in the violation section; and (2) showing that the result of such impairment was higher Kaletra prices paid by class members. I have already demonstrated that the process of proving the violation (including, for example, rival impairment) turns on common evidence. In this section, I further illustrate how common methods and evidence can be used to show that class members paid artificially inflated prices for Kaletra. Below, I discuss the following sources of classwide evidence available to prove that all or nearly all class members paid artificially inflated prices for Kaletra as a result of the challenged conduct: (1) Abbott's internal projections regarding the effects of its conduct; (2) standard economic theory and models regarding the effects of monopoly pricing, monopoly leveraging, and bundling on pricing; (3) Abbott's own transactional database and other sources

of marketwide data on pharmaceutical pricing (including IMS Health and Medi-Span); and, (4) governmental and academic studies demonstrating the economic effects of competition between therapeutically similar branded drugs.

1. Abbott's Internal Projections

42. As discussed above, there are two steps to plaintiffs' impact analysis. Plaintiffs would show, first, that Abbott's conduct impaired its rivals in the Boosted Market, and, second, that such impairment enhanced Abbott's monopoly power and led Abbott to charge higher prices. Both steps are conducive to classwide analysis. The first step (namely, proof of rival impairment) is part of the proof of violation analysis discussed earlier in the Declaration. All of the information and analysis of whether and the extent to which Abbott's conduct impaired its rivals' ability to compete are common to the class as a whole. One additional common source of evidence available for evaluating rival impairment is Abbott's internal projection documents, detailing what Abbott itself believed would be the effect of its conduct on its Boosted rivals.

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theory indicates that the greater the market share commanded by a firm with market power,[42] the higher the price it will be able to charge all things being equal. The standard monopoly model considers the relationship of a single firm with monopoly power to the entire group of purchasers as a whole.

Thus, as all purchasers in a standard economic market face the same suppliers (more technically, the same supply curve), analyzing the effect on prices flowing from the alleged impairment of competition in the Boosted Market would not vary across class members.

2. Standard Economic Theory/Marketplace Behavior

44. As discussed above, common evidence is available to show that, had Abbott not engaged in the alleged anticompetitive conduct, it would have faced stronger competition in the Boosted Market, and thus had less market share and, importantly, less market power. Economic theory indicates that firms with monopoly power will raise prices until they have maximized profits. Practically speaking, firms will attempt to increase price so as to maximize profits subject to external constraints engendered by regulatory interventions that exorbitant price hikes are likely to precipitate. In any case, there is a strong *a priori* basis for concluding that firms with monopoly power will charge supra-competitive prices. Thus, standard economic theory teaches that conduct that allows firms to enhance or maintain monopoly power leads to higher prices.

45. According to economic theory, the extent to which a monopolist will charge supra-competitive prices depends upon the sensitivity of purchaser demand to price, or the "price elasticity of demand." Other things being equal, the more inelastic demand for a product is (or, in other words, the less sensitive quantity demanded is to changes in price), the more a monopolist will be able to charge. Generally, economic research has shown that demand for

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42. William M. Landes & Richard A. Posner, *Market Power in Antitrust Cases*, 94 HARVARD LAW REVIEW 937, 944-45, 985-76 (1981).

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brand name pharmaceuticals is relatively price insensitive in the absence of competitive pressures.[43] However, as the empirical research and economic theory discussed below indicate, the entry of branded competitors into a market dominated by an incumbent, when close therapeutically to the incumbent, can still discipline prices to some degree. Because increases in market share lead to higher prices holding the elasticity of demand constant, the analysis will not vary class member to class member.[44] Thus, the use of economic theory to evaluate whether Abbott's impairment of rivals as it applies to the instant case will necessarily involve the use of common analysis.

46. Assessment of impact here, then, would involve application of standard economic models (some of which are discussed in the damages section below) and other common evidence to determine whether Kaletra prices in the but-for world would have been lower. The following table illustrates the increases to the Kaletra WAC that occurred in the actual world after the December 2003 Norvir price increase:

TABLE 4: KALETRA WAC PRICE INCREASES AFTER DECEMBER 2003 PRICE OF

	6/21/2005	10/16/2005	9/27/2006	10/2/2007
Kaletra WAC per Average Daily Dose	$19.68	$21.23	$22.08	$23.39
Percentage Increase over Previous Period	4.9%	7.9%	4.0%	5.9%

Source: Medi-Span Data

This classwide evidence suggests that Abbott may have waited to see if its attempted impairment of rivals in the Boosted Market would be effective before raising prices, and then did so. Economic theory and the additional classwide evidence presented in this section below are available to show that, at the very least, Kaletra's WAC would not have increased as rapidly or at

43. *See, e.g.*, John Rizzo, *Advertising and Entry in the Ethical Pharmaceutical Industry: The Case of Antihypertensive Drugs*, 42 JOURNAL OF LAW & ECONOMICS (1998).

44. *See* Landes & Posner, *supra*.

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all in the but-for world because, absent its conduct, Abbott would have been increasingly confronted with close (and likely superior) branded rivals, which common evidence suggests would have had a disciplining effect on Abbott's decisions as to whether or not to impose higher prices.

3. Studies Demonstrating the Economic Effects of Competition Between Branded Drugs

47. Studies suggest that branded drugs in the same therapeutic class can, where they are close substitutes, discipline the prices of their branded competitors to some degree. Perhaps the most direct statement of this effect comes from the dissertation of economist Scott Stern, now a professor at Kellogg Graduate School of Management at Northwestern University, who found:

> In contrast to a long theoretical literature focused on the competitive interaction between pioneer [branded] and generic products, this paper finds strong empirical evidence that, in the 1980s, a very important source of competition within pharmaceutical markets was the presence of different pioneer [branded] molecules . . . .[T]he presence of alternative pioneer [branded] therapies was an important check on the market power of pioneers [branded drug sellers].[45]

The U.S. Congressional Budget Office has recognized the salience of this research. The authors of a CBO study on the pharmaceutical market state, "Using average invoice prices, economist Scott Stern found that cross-price elasticities [a measure of buyers' sensitivity to price differences between similar brand-name drugs] in four therapeutic classes were consistent with the assertion that brand-name drugs compete in price."[46] Furthermore, two additional empirical studies have found direct evidence of branded price competition.[47] These studies indicate that if

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45. *See* SCOTT STERN, PRODUCT COMPETITION IN HIGH-TECHNOLOGY INDUSTRIES 48.

46 . *See* Congressional Budget Office, *How Increased Competition from Generic Drugs has Affected Prices and Returns in the Pharmaceutical Industry*, July 1998, at 21.

47. *See* Z. John Lu & William S. Comanor, *Strategic Pricing of New Pharmaceuticals*, 80 REVIEW OF ECONOMICS AND STATISTICS (1998) at 108 ("In addition, the number of branded substitutes has a substantial negative effect on launch prices, which reflects the importance of competitive pressures. Duplicate products thereby play an important economic role in pharmaceutical markets."). *See also* Ernst R. Berndt, Linda Bui, David Reiley & Glen Urban, The Role of Marketing, Product Quality and Price Competition in the Growth and Composition of the

Abbott's conduct impaired competition in the Boosted Market, the result would have been higher prices for Kaletra to all class members.

48. In sum, common evidence and methods are available to show that all or nearly all class members paid more for Norvir, Kaletra, or both due to the challenged conduct.

III. AGGREGATE DAMAGES TO THE CLASS AS A WHOLE CAN BE COMPUTED USING WELL ESTABLISHED ECONOMIC METHODS

49. In this section, I explain several damages models that could be used to estimate aggregate classwide damages. I conclude that standard economic models and common formulas exist that would allow for the estimation of aggregate overcharge damages to the class as a whole.

A. The Aggregate Overcharges Framework

50. Damages in this case are based on overcharges paid by direct purchasers of Norvir and Kaletra. Under plaintiffs' theory, there is an overcharge on two different products. First, class members paid more for Norvir because the anticompetitive conduct involved a substantial price hike on Norvir. Second, class members paid more for Kaletra because of Abbott's alleged anticompetitive impairment of rivals in the Boosted Market.

1. Norvir Aggregate Overcharges Framework

51. If the Court decides that the consumer-welfare standard is the appropriate framework for evaluating the per-unit overcharge on Norvir, then the calculation of aggregate overcharges is simple. The formula would be the average per-unit overcharge times the amount of units purchased by class members during the class period. This formula is conducive to classwide analysis as the overcharge on Norvir under the consumer-welfare standard is based

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U.S. Anti-Ulcer Drug Industry, NBER Working Paper 4904, Oct. 1994 at 36 ("Zantac increased share over Tagmet in part because the price premium commanded by Zantac declined from about 56% in 1983 to only about 25% in 1993.").

directly on the 400 percent Norvir WAC price increase. Furthermore, even if the Court finds that the *Cascade* framework is applicable to the present case, the aggregate damages formula "average per-unit overcharge times the amount of units purchased by class members during the class period" still applies. As shown in Section II.C above, implementing the Cascade "safe harbor" would merely affect the magnitude of the per-unit overcharge on Norvir. As the Abbott cost data required to estimate the *Cascade* "safe harbor" would not vary by class member, this overcharge framework is equally suitable as an input for calculating aggregate Norvir overcharges.

2. Kaletra Aggregate Overcharges Framework

52. There are a variety of economic models available to establish the price of Kaletra in the but-for world and to compute the aggregate overcharge to the class as a whole. The class overcharges are equal to the product of (1) average actual prices paid for Kaletra by class members minus the average but-for prices class members would have paid, and (2) the quantity of product purchased by the class as a whole. Thus, the damage formula allows one to make use of classwide averages to compute aggregate damages. This calculation of aggregate damages will be based solely on factors that are common to the class as a whole because it involves calculating average marketwide prices in both the actual and but-for worlds and determining the total quantity of products purchased by the class as a whole. IMS Health data, Medi-Span information, and Abbott's transactional database could be used to procure the necessary inputs for these calculations. As all of these sources can be used to derive aggregate prices and quantities, the data required to calculate aggregate Norvir and Kaletra damages will not vary by class member. Thus, the common empirical methods I discuss below can be used to determine, reliably, average but-for prices for Kaletra for the class as a whole.

B. Models That Estimate But-For Market Prices

1. The But-For Price of Norvir

53. Computing the but-for price for Norvir—that is, the price that would have persisted had Abbott not engaged in the challenged anticompetitive conduct is straightforward. For the consumer-welfare standard, Abbott's transactional database and other sources of marketwide pricing and sales data reflect Norvir prices before and after the conduct at issue. Accordingly, these data could be used to assess the actual and but-for Norvir prices through the use of a traditional "before and after" damages analysis. To compute the but-for Norvir price under the *Cascade* standard, I would need to compute the "safe harbor" as discussed above, which would involve all of the common evidence used in assessing the but-for price under the consumer-welfare standard, plus additional classwide evidence in the form of Abbott's internal cost data for Kaletra/lopinavir. Thus, common methods and evidence are available to establish reliably the but-for Norvir price paid by class members.

2. The But-For Price of Kaletra

54. Estimating the average but-for price of Kaletra is straightforward as well, but requires the use of different, but no less standard, economic models. There are economic models that allow one to estimate with a reasonable degree of confidence the extent to which the price of Kaletra would have been lower in a but-for world where the conduct in question did not occur. One reasonable approach, based on a conservative interpretation of the economic theory and studies discussed in Section II, would be to assume that the but-for price of Kaletra remained at the pre-Norvir-price-increase price of . It is also possible that Abbott would have been forced to lower its price below to compete with allegedly superior boosted PIs. Any one of the damages models that I describe below could estimate the difference between the Kaletra

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price observed in the actual world and the price that would have prevailed but-for the conduct in question.

a. Nash-Bertrand Differentiated Products Models

55. As noted previously, plaintiffs allege that, in the actual world, Abbott engaged in anticompetitive conduct to shield Kaletra from competition.[48] By leveraging its monopoly in the Boosting Market, Abbott's conduct allegedly impaired competition in the Boosted Market. The question this model would help answer is whether the alleged impairment of rivals caused the prices of Boosted PIs, including Kaletra, to be higher than they would have otherwise been.

56. Employing this model would involve assessing whether the products in question constitute a "differentiated product market"—that is, a market where the products differ in certain characteristics but still compete enough so that there is some cross-price elasticity of demand between the products. As such analysis involves comparing the products supplied in the market and aggregate consumer responses to those products, the issue is necessarily classwide.

57.

Absent Abbott's alleged anticompetitive conduct, Kaletra likely would have been eclipsed by the superior drugs Lexiva and Reyataz, causing Abbott to face greater price discipline. If Boosted PIs were a homogeneous product, then the absence of the conduct could result in significant price effects. In reality, there is evidence that Boosted PIs constitute differentiated products, which serves to temper (but not completely eliminate) price competition. The quality of AIDS drugs varies with respect to certain factors like efficacy and

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48. *Complaint* ¶ 25.
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side-effect profile.

Thus, there is evidence that Kaletra constitutes an imperfect substitute for the other Boosted PIs, Lexiva, and Reyataz.

58. To estimate but-for prices and assess damages, an economic model of the price-setting process in the but-for world may be useful. Assuming that the degree of product differentiation in the Boosted PI industry is economically significant, it would be reasonable to formally model Boosted PIs as differentiated products when calculating damages, instead of homogenous products.

59. The economic difference between homogeneous products and differentiated products can be illustrated formally using the following hypothetical example: Suppose, for simplicity, that there are two competing firms in a given industry. If the output produced by the two firms is homogenous, then the (inverse) industry demand curve might be represented as follows:

[4]

$$p = a - bQ = a - b(q_1 + q_2) = a - bq_1 - bq_2$$

Here, Q is the total industry wide quantity produced, q_1 is quantity produced by firm one, q_2 is quantity produced by firm two, and p is the industry wide price. Finally, a and b are positive constants. Importantly, note that an increase in either firm's output has an identical effect on the industry wide price: Consumers are indifferent between purchasing from either firm.

60. Now suppose that goods one and two in our hypothetical example are no longer perfect substitutes. In this case, firms one and two will typically set different prices for their products, because they will typically face different degrees of responsiveness to a given change in price. The demand curve for firm one might be written:

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[5] $$p_1 = a - b_1 q_1 - b_2 q_2$$

(Firm two would face an analogous demand curve). Here, p_1 is the price that firm one receives for selling a quantity q_1, given that firm two sells q_2. In contrast to the case of homogeneous products, a change in firm one's output does not have the same effect on firm one's price as a change in firm two's output, because b_1 and b_2 are not necessarily equal.[51]

61. In a differentiated products industry, each distinct product is governed by a different demand curve. Industrywide demand is governed by a system of interdependent demand equations, with one equation corresponding to each product in the system. In the instant case, I understand that there are at least three products that comprise the Boosted Market (the lopinavir portion of Kaletra, Lexiva, and Reyataz). Therefore, the demand system to be modeled would consist of three interdependent equations, one for each product:

[6] $$q_1 = q_1(p_1, p_2, p_3)$$

[7] $$q_2 = q_2(p_1, p_2, p_3)$$

[8] $$q_3 = q_3(p_1, p_2, p_3)$$

62. Products are frequently differentiated in practice, and the economic literature contains a multitude of empirical applications tailored to differentiated products industries.[52] The most common approach to modeling competitive interaction among firms in differentiated

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51. *See, e.g.*, CARLTON & PERLOFF, *supra*, at 203-205.

52. *See, e.g.*, Jerry Hausman and Gregory Leonard, *Econometric Analysis of Differentiated Products Mergers Using Real World Data*, 5 GEORGE MASON LAW REVIEW 321 (1997). *See also* Timothy Bresnahan, *Competition and Collusion in the American Automobile Industry: The 1955 Price War*, 35 THE JOURNAL OF INDUSTRIAL ECONOMICS 457 (1987); Steven Berry, James Levinsohnn and Ariel Pakes, *Automobile Prices in Market Equilibrium*, 63 ECONOMETRICA 841 (1995); Aviv Nevo, *Measuring Market Power in the Ready-to-Eat Cereal Industry*, 69 ECONOMETRICA 307 (2001); Amil Petrin, *Quantifying the Benefits of New Products: The Case of the Minivan*, 110 JOURNAL OF POLITICAL ECONOMY 705 (2002).

products industries in the economics literature is to employ a Nash-Bertrand equilibrium model.[53]

63. In the but-for world, each firm seeks to maximize its profits, which depend upon both its own price and the prices chosen by all other firms in the industry. In the instant case, I understand that each of the three products that comprise the Boosted Market is produced by separate firms. Under these conditions, the profit function for firm *i* (where *i* ranges from one to three) is given by:

[9] $$\pi_i = p_i q_i - c_i q_i = (p_i - c_i) q_i (p_1, p_2, p_3)$$

64. In a Nash-Bertrand equilibrium, firm *i* will maximize its profits by setting prices such that:

[10] $$q_i(p_1, p_2, p_3) + (p_i - c_i)\frac{\partial q_i}{\partial p_i} = 0$$

This implies that, in equilibrium, the firm chooses its price according to an inverse elasticity rule:[54]

[11] $$\frac{(p_i - c_i)}{p_i} = \frac{1}{\varepsilon_i}$$

where ε_i is the own-price elasticity of demand for product *i*.[55] In some empirical applications, the researcher may know the value of c_i, the marginal cost. In other instances, marginal cost may be inferred based on prices, demand elasticity estimates, and (if available), variables that shift the marginal cost function.[56]

65. The salient feature of Nash-Bertrand differentiated products models here is that prices and markups depend *only* upon Kaletra's own-price elasticities of demand, which are

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53. Carlton & Perloff, *supra*, at 231-232.

54. *See, e.g.*, Hausman & Leonard, *supra*, at 331.

55. The own-price elasticity of demand is a measure of price responsiveness commonly used in economics. The own-price elasticity for a given product is defined as the percentage change in quantity demanded for that product given a one percent increase in the price of that product. *See, e.g.*, CARLTON & PERLOFF, *supra*, at 65.

56. *Id.* at 231.

common across all class members. As noted above, the demand elasticity captures the collective tendency of purchasers to curtail purchases in the event of an increase in the price of a given product, holding other factors constant. Accordingly, the demand elasticity will not vary across class members. Thus, this model is quite well suited to the task of reliably estimating damages on a classwide basis.

b. Raising-Rivals'-Costs Model

66. Economists have demonstrated that a sufficient condition for a raising-rivals'-cost strategy to be profitable is that the exclusionary conduct shifts up the dominant firm's residual demand curve (equal to the market demand curve less the supply of the dominant firm's rivals) by more than it shifts up the dominant firm's average cost curve at the original output.[57] The shift in the dominant firm's residual demand curve depends on the elasticity of demand as well as the elasticity and shift of the "fringe" supply curve (that is, the rivals' supply curve).[58] The equilibrium pricing condition for the dominant firm that flows from this raising-rivals'-cost model[59] is

[12] $$S_a / (D_p - S_p) = C_a / x,$$

where S_a is the change in the fringe's supply given a change in the exclusionary conduct, D_p is the change in the market demand given a change in the dominant firm's price, S_p is the change in the fringe's supply given a change in the dominant firm's price, C_a is the change in the dominant firm's total cost given a change in the exclusionary conduct, and x is the output of the dominant firm. The left-hand-side of equation [12] represents the vertical shift in the residual demand

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57. Steven C. Salop & David T. Scheffman, *Raising Rivals' Costs*, 73 AMERICAN ECONOMIC REVIEW 267, 269 (1983).

58. *Id.*

59. Steven C. Salop & David T. Scheffman, *Cost Raising Strategies*, 36 JOURNAL OF INDUSTRIAL ECONOMICS 19, 22 (1987).

curve facing the dominant firm. The right-hand-side represents the change in the average cost of the dominant firm given a change in the firm's exclusionary conduct while holding the dominant firm's output constant.

67. As explained above, every dollar increase in the penalty price of Norvir increased the cost of buying a rival's product, thereby impairing rivals' ability to compete effectively. The translation of a lower effective price for a rival's product into lower prices for Kaletra is straightforward, and importantly, would be computed for all class members at once. In estimating but-for prices under this raising-rivals'-cost theory, neither the data needed to estimate this effect nor the implementation of the econometric model itself would vary across class members. In particular, the critical inputs to this model—namely, (1) the market elasticity of demand, (2) the elasticity of the fringe supply curve, and (3) the increase in the marginal cost of the fringe—will be the same across all class members. Thus, the economic analysis used to estimate but-for prices under the raising-rivals'-costs theory is the same for all members of the proposed class. Moreover, estimating damages this way would in fact be superior to individual assessments for each class member because these issues cannot meaningfully be assessed on an individual class member basis.

C. The Damages Issues Are Amenable to Classwide Analysis

68. In sum, each of these approaches to modeling but-for prices of Kaletra requires discrete inputs, some of which (such as the elasticity of demand for Norvir) are essentially the same under all three approaches. Most importantly, all of the inputs would be common to all members of the class. Some inputs would come from existing case materials (relating to Abbott and other manufacturers of boosted PIs) and other classwide documents from the files of manufacturers, including Abbott. Other inputs may come from IMS, Medi-Span, or Abbott's transactional database. None of these inputs would require evidence that would differ among

class members. Thus, I am highly confident that aggregate damages to the class as a whole can be computed using reliable methods on a classwide basis.

CONCLUSION

69. In summary, I find that the antitrust violation and antitrust impact on all of the proposed class of direct purchasers in this case can be reliably analyzed and proven using common methods and evidence. In particular, I conclude that common methods and evidence are available to show that all class members paid more for Norvir and Kaletra as a result of the conduct challenged by plaintiffs. It is also my opinion that standard economic models and methods are available to compute damages to the class as a whole.

***

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Hal J. Singer

EXECUTED ON MAY 5, 2008.

APPENDIX 1: MATERIALS RELIED UPON

Legal Documents

Abbott Laboratories' Supplemental Brief in Support of Its Summary Judgment Motion, or, In the Alternative, Brief in Support of (1) Motion for Leave to File Reconsideration Motion, (2) Motion for Continuance, and (3) Petition to Certify Interlocutory Appeal Under § 1292(B), Case 4:04-cv-01511-CW, Apr. 25, 2008

Cascade Health Solutions v. PeaceHealth, 515 F.3d 883 (9th Cir. 2007)

Consolidated Amended Complaint, Case No. C 07-5985 CW

Notice of Motion and Motion of Abbott Laboratories to Dismiss Plaintiffs' Consolidated Amended Compliant, Case 4:07-cv-05985-CW, Jan. 31, 2008

Order Denying Abbott's Motion to Dismiss, Case 4:07-cv-05702-CW, Apr. 11, 2008

Academic Articles, Research Articles, and Books

Aaron Edlin & Daniel Rubinfeld, *Exclusion or Efficient Pricing: The "Big Deal" Bundling of Academic Journals*, 72 ABA ANTITRUST LAW JOURNAL (2004)

Amil Petrin, *Quantifying the Benefits of New Products: The Case of the Minivan*, 110 JOURNAL OF POLITICAL ECONOMY (2002)

Aviv Nevo, *Measuring Market Power in the Ready-to-Eat Cereal Industry*, 69 ECONOMETRICA (2001)

Congressional Budget Office, *How Increased Competition from Generic Drugs has Affected Prices and Returns in the Pharmaceutical Industry*, July 1998

Dennis W. Carlton, *A General Analysis of Exclusionary Conduct and Refusal to Deal—Why Aspen and Kodak Are Misguided*, 68 ANTITRUST LAW JOURNAL (2001)

DENNIS W. CARLTON & JEFFREY M. PERLOFF, MODERN INDUSTRIAL ORGANIZATION (Addison-Wesley 3rd ed. 2000)

Einer Elhauge, *Defining Better Monopolization Standards*, 56 STANFORD LAW REVIEW (2003)

Ernst R. Berndt, Linda Bui, David Reiley & Glen Urban, The Role of Marketing, Product Quality and Price Competition in the Growth and Composition of the U.S. Anti-Ulcer Drug Industry, NBER Working Paper 4904, Oct. 1994

James E. Hodder & Yael A. Ilan, *Declining Prices and Optimality When Costs Follow an Experience Curve*, 7 MANAGERIAL AND DECISION ECONOMICS (1986)

Jerry Hausman and Gregory Leonard, *Econometric Analysis of Differentiated Products Mergers Using Real World Data*, 5 GEORGE MASON LAW REVIEW (1997)

John Rizzo, *Advertising and Entry in the Ethical Pharmaceutical Industry: The Case of Antihypertensive Drugs*, 42 JOURNAL OF LAW & ECONOMICS (1998)

Patrick Greenlee, David S. Reitman, David S. Sibley, An Antitrust Analysis of Bundled Loyalty Discounts, Economic Analysis Group Discussion Paper No. 04-13 (2006)

Medi-Span Reference Pricing Definitions and Reporting Guidelines

Michael L. Katz & Carl Shapiro, *Systems Competition and Network Effects*, 8 JOURNAL OF ECONOMIC PERSPECTIVES (1994)

Michael Whinston, *Tying, Foreclosure and Exclusion*, 80 AMERICAN ECONOMIC REVIEW (1990)

ROBERT H. BORK, THE ANTITRUST PARADOX (Free Press 1978)

SCOTT STERN, PRODUCT COMPETITION IN HIGH-TECHNOLOGY INDUSTRIES

Steven Berry, James Levinsohnn and Ariel Pakes, *Automobile Prices in Market Equilibrium*, 63 ECONOMETRICA (1995)

Steven C. Salop & David T. Scheffman, *Cost Raising Strategies*, 36 JOURNAL OF INDUSTRIAL ECONOMICS (1987)

Steven C. Salop & David T. Scheffman, *Raising Rivals' Costs*, 73 AMERICAN ECONOMIC REVIEW (1983).

Thomas G. Krattenmaker & Stephen C. Salop, *Anticompetitive Exclusion: Raising Rivals' Costs to Achieve Power Over Price*, 96 YALE LAW JOURNAL (1986)

Timothy Bresnahan, *Competition and Collusion in the American Automobile Industry: The 1955 Price War*, 35 THE JOURNAL OF INDUSTRIAL ECONOMICS (1987)

WILLIAM J. BAUMOL & ALAN S. BLINDER, MICROECONOMICS PRINCIPLES AND POLICY (Harcourt Brace & Company 7th ed. 1997)

William M. Landes & Richard A. Posner, *Market Power in Antitrust Cases*, 94 HARVARD LAW REVIEW (1981)

Z. John Lu & William S. Comanor, *Strategic Pricing of New Pharmaceuticals*, 80 REVIEW OF ECONOMICS AND STATISTICS (1998)

Case Materials

Deposition of Joseph Fiske, Aug. 15, 2007

NOR 000251140-141

NOR 00062663

NOR 00078210-11

NOR 00042210-11

NOR 00093131

NOR 00007335

NOR 00009724

NOR 00013358-59

NOR 00029265-66

NOR 00045542

NOR 00045867

NOR 00078210

NOR 00101642

NOR 00040671-74

NOR 00020345

NOR 00020357

NOR 00020375

NOR 00020736

NOR 00042518

NOR 00013210-294

NOR 00091750-762

NOR 00093821-22

NOR 00039165-174

NOR 00062288-301

NOR 00061947-57

NOR 00026242-49

NOR 00029721-25

NOR 00034857-62

Data

Abbott Transactional Database

Medi-Span Data

APPENDIX 2: CURRICULUM VITAE

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EDUCATION

THE JOHNS HOPKINS UNIVERSITY, Ph.D., 1999; M.A. (Economics), 1996.

TULANE UNIVERSITY, B.S. *magna cum laude* (Economics), 1994. Dean's Honor Scholar (full academic scholarship). Senior Scholar Prize in Economics, 1994.

CURRENT EMPLOYMENT

CRITERION ECONOMICS, L.L.C., Washington, D.C.: President, 2004-present. Senior Vice President, 1999-2004.

EMPLOYMENT HISTORY

LECG, INC., WASHINGTON, D.C.: Senior Economist, 1998-99.

U.S. SECURITIES AND EXCHANGE COMMISSION, OFFICE OF ECONOMIC ANALYSIS, WASHINGTON, D.C.: Staff Economist, 1997-98.

THE JOHNS HOPKINS UNIVERSITY, ECONOMICS DEPARTMENT, BALTIMORE: Teaching Assistant, 1996-98.

AUTHORED BOOKS AND BOOK CHAPTERS

An Antitrust Analysis of the World Trade Organization's Decision in the U.S.-Mexico Arbitration on Telecommunications Services, co-authored with J. Gregory Sidak, in HANDBOOK OF TRANS-ATLANTIC ANTITRUST (Philip Marsden, ed. Edward Elgar 2006).

BROADBAND IN EUROPE: HOW BRUSSELS CAN WIRE THE INFORMATION SOCIETY, co-authored with Dan Maldoom, Richard Marsden, and J. Gregory Sidak (Kluwer/Springer Press 2005).

Are Vertically Integrated DSL Providers Squeezing Unaffiliated ISPs (and Should We Care)?, co-authored with Robert W. Crandall, in ACCESS PRICING: THEORY, PRACTICE AND EMPIRICAL EVIDENCE (Justus Haucap and Ralf Dewenter eds., Elsevier Press 2005).

JOURNAL ARTICLES

1. *Evaluating Market Power with Two-Sided Demand and Preemptive Offers to Dissipate Monopoly Rent: Lessons for High-Technology Industries from the Antitrust Division's Approval of the XM-Sirius Satellite Radio Merger*, 4 JOURNAL OF COMPETITION LAW & ECONOMICS (forthcoming 2008), co-authored with J. Gregory Sidak.

2. *Assessing Bias in Patent Infringement Cases: A Review of International Trade Commission Decisions*, 21 HARVARD JOURNAL OF LAW AND TECHNOLOGY (forthcoming 2008), co-authored with Robert W. Hahn.

3. *The Effect of Incumbent Bidding in Set-Aside Auctions: An Analysis of Prices in the Closed and Open Segments of FCC Auction 35*, 32 TELECOMMUNICATIONS POLICY JOURNAL (2008), co-authored with Peter Cramton and Allan Ingraham.

4. *A Real-Option Approach to Valuing Life Settlement Transactions*, 22 JOURNAL OF FINANCIAL TRANSFORMATION (Sept. 2008), co-authored with Joseph R. Mason.

5. *The Economics of Wireless Net Neutrality*, 3 JOURNAL OF COMPETITION LAW AND ECONOMICS 399 (2007), co-authored with Robert W. Hahn and Robert E Litan.

6. *Vertical Foreclosure in Video Programming Markets: Implication for Cable Operators*, 3 REVIEW OF NETWORK ECONOMICS 348 (2007), co-authored with J. Gregory Sidak.

7. *The Unintended Consequences of Net Neutrality*, 5 JOURNAL ON TELECOMMUNICATIONS AND HIGH TECH LAW 533 (2007), co-authored with Robert E. Litan.

8. *Does Video Delivered Over a Telephone Network Require a Cable Franchise?*, 59 FEDERAL COMMUNICATIONS LAW JOURNAL 251 (2007), co-authored with Robert W. Crandall and J. Gregory Sidak.

9. *The Competitive Effects of a Cable Television Operator's Refusal to Carry DSL Advertising*, 2 JOURNAL OF COMPETITION LAW AND ECONOMICS 301 (2006).

10. *Uberregulation without Economics: The World Trade Organization's Decision in the U.S.-Mexico Arbitration on Telecommunications Services*, 57 FEDERAL COMMUNICATIONS LAW JOURNAL 1 (2004), co-authored with J. Gregory Sidak.

11. *The Secondary Market for Life Insurance Policies: Uncovering Life Insurance's "Hidden" Value*, 6 MARQUETTE ELDER'S ADVISOR 95 (2004), co-authored with Neil A. Doherty and Brian A. O'Dea.

12. *Do Unbundling Policies Discourage CLEC Facilities-Based Investment?*, 4 TOPICS IN ECONOMIC ANALYSIS AND POLICY (2004), co-authored with Robert W. Crandall and Allan T. Ingraham.

13. *Foreign Investment Restrictions as Industrial Policy*, 3 CANADIAN JOURNAL OF LAW AND TECHNOLOGY 19 (2004), co-authored with Robert W. Crandall.

14. *Regulating the Secondary Market for Life Insurance Policies*, 21 JOURNAL OF INSURANCE REGULATION 63 (2003), co-authored with Neil A. Doherty.

15. *Interim Pricing of Local Loop Unbundling in Ireland: Epilogue*, 4 JOURNAL OF NETWORK INDUSTRIES 119 (2003), co-authored with J. Gregory Sidak.

16. *The Benefits of a Secondary Market for Life Insurance*, 38 REAL PROPERTY, PROBATE AND TRUST JOURNAL 449 (2003), co-authored with Neil A. Doherty.

17. *The Empirical Case Against Asymmetric Regulation of Broadband Internet Access*, 17 BERKELEY TECHNOLOGY LAW JOURNAL 954 (2002), co-authored with Robert W. Crandall and J. Gregory Sidak.

18. *How Can Regulators Set Nonarbitrary Interim Rates? The Case of Local Loop Unbundling in Ireland*, 3 JOURNAL OF NETWORK INDUSTRIES 273 (2002), co-authored with J. Gregory Sidak.

19. *Vertical Foreclosure in Broadband Access*, 49 JOURNAL OF INDUSTRIAL ECONOMICS (2001) 299, co-authored with Daniel L. Rubinfeld.

20. *Open Access to Broadband Networks: A Case Study of the AOL/Time Warner Merger*, 16 BERKELEY TECHNOLOGY LAW JOURNAL 640 (2001), co-authored with Daniel L. Rubinfeld.

21. *Cable Modems and DSL: Broadband Internet Access for Residential Customers*, 91 AMERICAN ECONOMICS ASSOCIATION PAPERS AND PROCEEDINGS 302 (2001), co-authored with Jerry A. Hausman and J. Gregory Sidak.

22. *Residential Demand for Broadband Telecommunications and Consumer Access to Unaffiliated Internet Content Providers*, 18 YALE JOURNAL ON REGULATION 1 (2001), co-authored with Jerry A. Hausman and J. Gregory Sidak.

23. *Determining the Source of Inter-License Synergies in Two-Way Paging Networks*, 18 JOURNAL OF REGULATORY ECONOMICS 59 (2000).

24. *A General Framework for Competitive Analysis in the Wireless Industry*, 50 HASTINGS LAW REVIEW 1639 (2000), co-authored with J. Gregory Sidak and David Teece.

25. *Capital Raising in Offshore Markets*, 23 JOURNAL OF BUSINESS AND FINANCE 1181 (1999), co-authored with Ian Gray and Reena Aggarwal.

EXPERT TESTIMONY

1. Declaration of Robert E. Litan, Robert W. Hahn and Hal J. Singer on behalf of CTIA, In Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services, Federal Communications Commission, WT Dkt. No. 08-27 (Apr. 10, 2008).

2. Declaration of Hal J. Singer on behalf of Mid-Atlantic Sports Network in TCR Sports Broadcasting Holding, L.L.P., t/a Mid-Atlantic Sports Network v. Comcast Corporation, Case No. (Md. Cir. Ct. Baltimore City) (Mar. 21, 2008).

3. Declaration of Hal J. Singer on behalf of Southeast Missouri Hospital, et al. in Southeast Missouri Hospital et al. v. C.R. Bard, Inc., Case No. 1:07CV0031 TCM (E.D.Mo. 2007) (Mar. 10, 2008).

4. Declaration of Hal J. Singer on behalf of M&A Distributing Company in Coors Brewing Company v. Hipal Partners Ltd., Case No. 71 155 00358 07 (American Arbitration Association 2007) (Mar. 3, 2008).

5. Declaration of Allan T. Ingraham and Hal J. Singer on behalf of the Consumer Coalition for Competition in Satellite Radio, In the Matter of Sirius Satellite Radio, Inc. and XM Satellite Radio, Inc., Applications for Approval of Transfer of Control, Federal Communications Commission, MB Dkt. 07-57 (Feb. 27, 2008).

6. Reply Declaration of Hal J. Singer on behalf of Direct Purchasers in Natchitoches Parish Hosp. Serv. Dist. v. Tyco Int'l, Ltd. et al. (D. Mass. 2005) (Feb. 15, 2008).

7. Affidavit of Hal J. Singer on behalf of the Ralph O. Stalsberg Irrevocable Trust in Ralph O. Stalsberg, an Individual, Lonnie R. Stalsberg, as Trustee for the Ralph O. Stalsberg Irrevocable Trust I Dtd. 9/28/2004 v. New York Life Insurance Company, New York Life Insurance and Annuity Corporation, Case No. 2:07-Cv-29-Bj (D. Utah 2007) (Feb. 8, 2008).

8. Expert Report of Hal J. Singer on behalf of Direct Purchasers in Natchitoches Parish Hosp. Serv. Dist. v. Tyco Int'l, Ltd. et al. (D. Mass. 2005) (Dec. 18, 2007).

9. Reply Declaration of Hal J. Singer on behalf of PacifiCare Health System, Inc., *In Re* Tricor Indirect Purchaser Antitrust Litigation, C.A. No. 05-360 (KAJ) (D. Del 2006) (Oct. 8, 2007).

10. Reply Declaration of Hal J. Singer on behalf of Direct Purchasers in Natchitoches Parish Hosp. Serv. Dist. v. Tyco Int'l, Ltd. et al. (D. Mass. 2005) (Feb. 9, 2007).

11. Declaration of Hal J. Singer on behalf of Direct Purchasers in Natchitoches Parish Hosp. Serv. Dist. v. Tyco Int'l, Ltd. et al. (D. Mass. 2005) (Dec. 15, 2006).

12. Declaration of Hal J. Singer on behalf of PacifiCare Health System, Inc., *In Re* Tricor Indirect Purchaser Antitrust Litigation, C.A. No. 05-360 (KAJ) (D. Del 2006) (Dec. 15, 2006).

13. Reply Declaration of J. Gregory Sidak and Hal J. Singer on behalf of Mid-Atlantic Sports Network, In the Matter of Comcast Corp., Time Warner Cable, Inc. and Adelphia Communications Corp., Applications for Consent to the Assignment and/or Transfer of Control of Licenses, MB Dkt. No. 05-192 (Nov. 15, 2005).

14. Declaration of J. Gregory Sidak and Hal J. Singer on behalf of the Power Mobility Coalition, In the Power Mobility Coalition v. Michael O. Leavitt, Secretary, U.S. Department of Health and Human Services, and Mark B. McClellan, Administrator, Centers for Medicare and Medicaid (D.D.C. 2005) (Oct. 13, 2005).

15. Comments of Robert W. Crandall and Hal J. Singer on behalf of TELUS Communications Inc., In the Matter of Telecommunications Policy Review, Canadian Radio-television and Telecommunications Commission (Aug. 15, 2005).

16. Declaration of J. Gregory Sidak and Hal J. Singer on behalf of Mid-Atlantic Sports Network, In the Matter of Comcast Corp., Time Warner Cable, Inc. and Adelphia Communications Corp., Applications for Consent to the Assignment and/or Transfer of Control of Licenses, MB Dkt. No. 05-192 (July 22, 2005).

17. Reply Declaration of Robert W. Crandall and Hal J. Singer on behalf of Verizon Communications Inc. and MCI, Inc., In the Matter of Verizon Communications Inc. and MCI, Inc. Applications for Approval of Transfer of Control, Federal Communications Commission, WC Dkt. No. 05-75 (May 23, 2005).

18. Declaration of Robert W. Crandall and Hal J. Singer on behalf of Verizon Communications Inc. and MCI, Inc., In the Matter of Verizon Communications Inc. and MCI, Inc. Applications for Approval of Transfer of Control, Federal Communications Commission, WC Dkt. No. 05-75 (Mar. 10, 2005).

19. The Competitive Impacts of Restraints in the Contact Lens Industry: Reply to OSI's Comments (prepared for 1-800 CONTACTS for submission to the Federal Trade Commission Policy Division), co-authored with Einer Elhauge and Andrew N. Kleit (Dec. 20, 2004).

20. Reply Declaration of Robert W. Crandall and Hal J. Singer on behalf of SBC Communications Inc., In the Matter of EarthLink Inc. v. SBC Communications, Inc., Federal Communications Commission, No. EB-04-MD-006 (Dec. 10, 2004).

21. Economic Analysis of the Proposed Merger of OSI and CooperVision (prepared for 1-800 CONTACTS for submission to the Federal Trade Commission Merger Division), co-authored with Einer Elhauge and Andy Kleit (Dec. 13, 2004).

22. Declaration of Robert W. Crandall and Hal J. Singer on behalf of Verizon Communications Inc., In the Matter of Unbundled Network Access Elements, Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, Federal Communications Commission, WC Dkt. No. 04-313, CC Dkt. No. 01-338 (Oct. 18, 2004).

23. Declaration of Robert W. Crandall and Hal J. Singer on behalf of SBC Communications Inc., In the Matter of EarthLink Inc. v. SBC Communications, Inc., Federal Communications Commission, No. EB-04-MD-006 (June 15, 2004).

24. Rebuttal Report of Hal J. Singer on behalf of the Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation, In Burlington Northern and Santa Fe Railway Company v. Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation (D. Mont. 2004) (No. CV-01-34-BLG).

25. Declaration of Hal J. Singer on behalf of the Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation, In Burlington Northern and Santa Fe Railway Company v. Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation (D. Mont. 2003) (No. CV-01-34-BLG).

26. Declaration of Hal J. Singer on behalf of Tomas H. Miguens, In Q International Courier v. Tomas H. Miguens (S.D.N.Y. 2003) (No. 02 Civ. 5278-JSM).

27. Declaration of Robert W. Crandall and Hal J. Singer on behalf of Bell Canada Enterprises, In the Matter of Hearings before the Standing Committee On Industry, Science And Technology of the House of Commons of Canada Pursuant to Standing Order 108(2), Consideration of Foreign Investment Restrictions Applicable to Telecommunications Common Carriers (Feb. 20. 2003).

28. Declaration of J. Gregory Sidak and Hal J. Singer on behalf of The Walt Disney Company, *et al.*, In the Matter of Nondiscrimination in the Distribution of Interactive Television Services over Cable, Notice of Inquiry, Federal Communications Commission, Federal Communications Commission, CS Dkt. No. 01-7 (May 11, 2001).

29. Declaration of Hal J. Singer on behalf of Allegheny Communications, Inc., In Allegheny Communications Inc. v. F.C.C. (D.C. Cir. 2000) (No. 00-1524).

Commissioned White Papers

1. Is Greater Price Transparency Needed in The Medical Device Industry? (prepared for Advanced Medical Technology Association), co-authored with Robert W. Hahn (Nov. 30, 2007).

2. Should the FCC Depart from More than a Decade of Market-Oriented Spectrum Policy? Reply to Skrzypacz and Wilson (prepared for CTIA), co-authored with Gerald Faulhaber and Robert W. Hahn (Jun. 18, 2007).

3. Does Retransmission Consent Contribute To Rising Cable Rates? (prepared for the National Association of Broadcasters), co-authored with Jeffrey A. Eisenach and James C. Miller III (Mar. 9, 2007).

4. Does Public Safety Need More Spectrum? (prepared for Verizon Wireless), co-authored with Peter Cramton, Thomas S. Dombrowsky, Jr., Jeffrey A. Eisenach and Allan Ingraham (Nov. 9, 2006).

5. The Budgetary Impact of Eliminating the GPOs' Safe Harbor Exemption from the Anti-Kickback Statute of the Social Security Act (prepared for the Medical Device Manufacturers Association) (Dec. 20, 2005).

6. Reply to "The Life Settlements Market: An Actuarial Perspective on Consumer Economic Value" (prepared for Coventry First), co-authored with Eric Stallard (Nov. 15, 2005).

7. The Competitive Effects of Telephone Entry into Video Markets (prepared for the Internet Innovation Alliance), co-authored with Robert W. Crandall and J. Gregory Sidak (Nov. 9, 2005).
8. How Do Consumers and the Auto Industry Respond to Changes in Exhaust Emission and Fuel Economy Standards? A Critique of Burke, Abeles, and Chen (prepared for General Motors Corp.), co-authored with Robert W. Crandall and Allan T. Ingraham (Sept. 21, 2004).

9. Inter-City Competition for Retail Trade in North Texas: Can a TIF Generate Incremental Tax Receipts for the City of Dallas? (prepared for Harvest Partners), co-authored with Thomas G. Thibodeau and Allan T. Ingraham (July 16, 2004).

10. An Accurate Scorecard of the Telecommunications Act of 1996: Rejoinder to the Phoenix Center Study No. 7 (prepared for BellSouth), co-authored with Robert Crandall (Jan. 6, 2004).

11. Competition in Broadband Provision and Implications for Regulatory Policy (prepared for the Alcatel, British Telecom, Deutsche Telekom, Ericsson, France Telecom, Siemens, Telefónica de España, and Telecom Italia), co-authored with Dan Maldoom, Richard Marsden, and Gregory Sidak (Oct. 15, 2003).

12. The Effect of Ubiquitous Broadband Adoption on Investment, Jobs, and the U.S. Economy (prepared for Verizon), co-authored with Robert W. Crandall (Sept. 17, 2003).

13. The Deleterious Effect of Extending the Unbundling Regime on Telecommunications Investment (prepared for BellSouth), co-authored with Robert W. Crandall (July 10, 2003).

14. Letter Concerning Spectrum Auction 35 to the Honorable Michael K. Powell, Chairman, Federal Communications Commission, from Peter C. Cramton, Robert W. Crandall, Robert W. Hahn, Robert G. Harris, Jerry A. Hausman, Thomas W. Hazlett, Douglas G. Lichtman, Paul W. MacAvoy, Paul R. Milgrom, Richard Schmalensee, J. Gregory Sidak, Hal J. Singer, Vernon L. Smith, William Taylor, and David J. Teece (Aug. 16, 2002).

WORKING PAPERS POSTED TO SSRN

1. *Irrational Expectations: Can a Regulator Credibly Commit to Removing an Unbundling Obligation?*, AEI-Brookings Joint Center Related Publication No. 07-28, co-authored with Jeffrey A. Eisenach (Dec. 2007).

2. *An Antitrust Analysis of Google's Proposed Acquisition of DoubleClick*, AEI-Brookings Joint Center Related Publication No. 07-24, co-authored with Robert W. Hahn (Sept. 2007).

3. *Inter-City Competition for Retail Trade in North Texas: Can a TIF Generate Incremental Tax Receipts for the City of Dallas?*, co-authored with Thomas G. Thibodeau and Allan T. Ingraham (revise and resubmit to JOURNAL OF REAL ESTATE RESEARCH) (July 16, 2004).

4. *An Economic Assessment of the Weight-Based CAFE Standard Proposed by the National Highway Traffic Safety Administration*, co-authored with Robert W. Crandall and Allan T. Ingraham (Apr. 2004).

5. *How Common Are "Conflicts of Interests" in the Investment Banking Industry?*, co-authored with Charles W. Calomiris (Dec. 2003).

6. *Does Clustering by Incumbent MSOs Deter Entry by Overbuilders?* (July 2002).

SPEAKING ENGAGEMENTS

1. *The Debate Over Network Management: An Economic Perspective*, AMERICAN ENTERPRISE INSTITUTE CENTER FOR REGULATORY AND MARKET STUDIES, Washington, D.C., Apr. 2, 2008.

2. *Merger Policy in High-Tech Industries*, GEORGE MASON UNIVERSITY SCHOOL OF LAW, Washington, D.C., Feb. 1, 2008.

3. *Telecommunications Symposium*, U.S. DEPARTMENT OF JUSTICE ANTITRUST DIVISION, Washington, D.C., Nov. 29, 2007.

4. *Wireless Practice Luncheon*, FEDERAL COMMUNICATIONS BAR ASSOCIATION, Washington, D.C., Nov. 29, 2007.

5. *Association for Computing Machinery's Net Neutrality Symposium*, GEORGE WASHINGTON UNIVERSITY, Washington, D.C., Nov. 12, 2007.

6. *Regulators' AdvanceComm Summit*, NEW YORK LAW SCHOOL, New York, N.Y., Oct. 14, 2007.

7. *Annual Conference*, CAPACITY USA 2007, New York, N.Y., Jun. 26, 2007.

8. *William Pitt Debating Union*, UNIVERSITY OF PITTSBURGH, SCHOOL OF ARTS & SCIENCES, Pittsburgh, PA., Feb. 23, 2007.

9. *Annual Conference*, WIRELESS COMMUNICATIONS ASSOCIATION INTERNATIONAL, Washington, D.C., June 27, 2006.

10. *Annual Conference*, MEDICAL DEVICE MANUFACTURERS ASSOCIATION, Washington, D.C., June 14, 2006.

11. *Annual Conference*, ASSOCIATION FOR ADVANCED LIFE UNDERWRITING, Washington, D.C., May 1, 2006.

12. *Entrepreneur Lecture Series*, LAFAYETTE COLLEGE, Easton, PA., Nov. 14, 2005.

EDITORIALS AND MAGAZINE ARTICLES

1. *Foxes in the Henhouse: FCC Regulation through Merger Review*, MILKEN INSTITUTE REVIEW (First Quarter 2008), co-authored with J. Gregory Sidak.

2. *Don't Drink the CAFE Kool-Aid*, WALL STREET JOURNAL, Sept. 6, 2007, at A17, co-authored with Robert W. Crandall.

3. *The Knee-Jerk Reaction: Misunderstanding the XM/Sirius Merger*, WASHINGTON TIMES, Aug. 24, 2007, at A19, co-authored with J. Gregory Sidak.

4. *Net Neutrality: A Radical Form of Non-Discrimination*, REGULATION, Summer 2007.

5. *Telecom Time Warp*, WALL STREET JOURNAL, July 11, 2007, at A15, co-authored with Robert W. Crandall.

6. *Earmarked Airwaves*, WASHINGTON POST, June 27, 2007, at A19, co-authored with Robert W. Hahn.

7. *Not Neutrality*, NATIONAL POST, Mar. 29, 2007, at FP19.

8. *Should ATM Fees Be Regulated?*, NATIONAL POST, Mar. 8, 2007, at FP17, co-authored with Robert W. Crandall.

9. *Life Support for ISPs*, REGULATION, Fall 2005, co-authored with Robert W. Crandall.

10. *No Two-Tier Telecommunications*, NATIONAL POST, Mar. 7, 2003, at FP15, co-authored with Robert W. Crandall.

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